REMARKS

Claims 1-16 have been cancelled in favor of new Claims 17-43 which are now active and under consideration in this case.

REQUEST FOR RECONSIDERATION

Conventional electric double layer capacitors typically contain a pair of electrodes consisting mainly of activated carbon which are formed on a current collector with a separator sandwiched therebetween, together with an electrolytic solution, and which is sealed in a metal case by means of a metal lid and a gasket insulating the case from the lid. For applications which require large currents and large capacitance, a stack type electric double layer capacitor is used. In particular, a plurality of sheet electrodes formed into a rectangle as positive electrodes and negative electrodes, are alternately stacked on one another by means of a separator interposed therebetween to obtain a stacked element, a positive electrode lead material and a negative electrode lead material which are connected with the respective terminals of the positive electrodes and the negative electrodes by caulking. This is accommodated in a case and impregnated with an electrolytic solution and sealed with a lid.

The capacitance of a capacitor per unit area of the electrode is greatly influenced by physical properties of both solid (electrode) and liquid (electrolytic solution), as well as by its constitution and operational principle. While various electrolytic solutions have been used, a porous electrode mainly composed of activated carbon has been most often used as the solid electrode. Unfortunately, the capacitance thereof is still quite low.

Quite surprisingly, the present invention provides a carbonaceous material having a large specific surface area, from which a high capacitance is obtained.

In particular, the present invention provides a carbonaceous material having a total pore volume of from 0.5 to 1.5 cm^3/g per unit mass, a volume of micropores having diameters of from 10 to 20 Å or from 10 to 45% based on total pore volume, a volume of mesopores having diameters of from 20 to 200 Å of from 35 to 65% based on the total pore volume, a volume of macropores having diameters exceeding 200 Å of not more than 15% based on the total pore volume, and a specific surface area of from 1,000 to 2,500 m^2/g.

At the outset, it is noted that U.S. 6,038,123 is assigned to Asahi Glass Company, Limited alone; while the present application is assigned to Asahi Glass Company, Limited and ADCHEMCO Corporation. Although basic features of the present invention, such as the type of electrolytic solution, were known at the time the present application was filed, the present invention is predicated, in part, upon the discovery that an electric double layer capacitor can be provided having excellent properties, such as improved capacitance and internal resistance, using such known other conventional features, but with the important addition of the present carbonaceous material. Thus, the present invention is clearly patentably distinct from and over U.S. 6,038,123.

Claims 1, 2, 6, 7, 8, 11, 15 and 16 stand rejected under 35 U.S.C. §102(b) as anticipated by, or, in the alternative, under 35 U.S.C. §103(a) as obvious over the English abstract of Japanese Patent Application No. 06-216,446. However, this reference clearly fails to either disclose or suggest the present invention.

In particular, in accordance with this reference, a phenol resin is used as a material for an activated carbon, but it is at all not clear whether the phenol resin is a liquid or a solid, and the amount of viscosity of the volatile component is also unclear. The reference neither discloses nor suggests the same.

In contrast, it is made clear in the present specification that, these particularities are an important aspect of the present invention and they are, thus, clearly not obvious.

Furthermore, in accordance with the present invention, a resin is cured, then the obtained cured product is pulverized and carbonized, whereas in the reference, the cured product is carbonized and then subjected to primary activation, followed by pulverization. This reference fails to either disclose or suggest directly pulverizing the cured product.

Moreover, the reference describes that the specific surface area is preferably from 600 to 1,500 m^2/g; however, it neither discloses nor suggests the ratio of the volumes of the micropores, mesopores and macropores based on the total volume of pores and the volume of the respective pores. The importance of the present distribution of micropores, mesopores and macropores is noted at pages 9-12 of the present specification and the results indicated in Table 1 at pages 48 and 49 of the present specification. The cited reference fails to disclose or suggest this important aspect of the present invention.

Hence, this ground of rejection is believed to be unsustainable and should be withdrawn.

Claims 1-8 and 11-16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the English abstract of JP 06-216,446 in view of JP 5-243,092A and JP 02-297,915A. However, neither of the latter two cited references, either alone or in combination, would correct the deficiencies of JP 06-216,446.

In particular, JP 02-297,915 describes the use, as a material for electrodes of an electric double layer capacitor, activated carbon obtained by foaming and curing a phenol resin and carbonizing and activating the obtained foamed product. A foaming agent is added to the phenol resin for curing, however, it is unclear whether the phenol resin is a liquid or a solid, and no viscosity of the resin is disclosed. Further, the reference fails to either disclose

or suggest the pore size distribution of the obtained activated carbon. Thus, this reference clearly fails to correct the deficiencies of JP 06-216,446.

Furthermore, JP 05-243,092 pertains to an electrolytic capacitor, and not to an electric double layer capacitor. Notably, salicylic acid is used for an electrolytic solution of an electrolytic capacitor, and electrodes of the electrolytic capacitor consist of aluminum foil alone and no activated carbon is used. This reference clearly has nothing to do with the present invention whatsoever and would fail to correct the deficiencies of JP 06-216,446.

Hence, this ground of rejection is also believed to be unsustainable and should be withdrawn.

Claims 1, 2, 6, 7, 8, 11, 15 and 16 stand rejected under 35 U.S.C. §103(a) as being obvious from the English abstract of JP 06-216,446.

However, the comments set forth above regarding this reference are believed to be applicable to this ground of rejection as well.

Claims 1-16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the English abstract of JP 06-216,446 in view of JP 2-297,915A and JP 5-243,092A and further in view of U.S. 5,754,393. However, U.S. 5,754,393 fails to correct the deficiencies of all of the former cited references.

In particular, although this reference pertains to an electric double layer capacitor, it neither discloses nor suggests the carbonaceous material of the present invention. In fact, this reference fails to provide any description of pore size whatsoever for a carbonaceous material.

Hence, this ground of rejection is also believed to be unsustainable and should be withdrawn.

Additionally, it is noted that the unobviousness of the present invention over even the combined techniques of the cited reference is clear from the Examples and Comparative Examples of the present specification. Specifically, the Comparative Examples utilize a i) resin viscosity, ii) boiling point of volatile component, and iii) mass reduction during carbonization which are outside of the corresponding ranges for the present production process. The results of these differences are notable.

Claims 8-16 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-19 of U.S. 6,038,123.

However, the present invention is clearly patentably distinct over U.S. 6,038,123, for the reason indicated above.

Furthermore, attached herewith is the executed Rule 132 Declaration of Yasuo Sinozaki, which establishes the differences between the carbonaceous material of the present invention those of Examples 1 and 2 of U.S. 6,038,123. See Table 1 of the Declaration. Also, the Raman spectrum of the activated carbon of Example 2 of the present specification was measured and $I_g(A)/I_g(G)$ and $I_d(G)/I_g(G)$ as defined in U.S. 6,038,123 were obtained and were 0.49 and 0.81, respectively. From this, it was determined that the Raman spectrum is different from that obtained for the activated carbon of U.S. 6,038,123. Hence, the carbonaceous material of the reference is different from that of the present invention

However, this ground of rejection is deemed moot.

Claims 4, 5, 13 and 14 stand objected to under 35 USC §112, second paragraph, as reciting "mass percent". However, "mass percent" and "weight percent" are used

interchangedly.[1] Moreover, "weight" is not an SI unit. Consequently, "mass" has been used instead.

Claim 10 stands objected to due to the term "sulfolane derivative."

However, in view of the above amendments, this ground of rejection is moot.

Finally, it is clarified that "Ketchen black" is a tradename, and is a type of carbon black. See page 30, lines 22 and 23 of the present specification.

Accordingly, in view of all of the above, it is believed that the present application now stands in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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[1]The relationship between "mass" and "weight" may be stated as follows:

> Weight is the resultant force acting on a mass (in a vacuum) due to the earth's gravitional field corrected for the effect of the earthy's rotation. See Concise Encyclopedia of Science & Technology, page 2041 (Third Edition)

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IN THE CLAIMS

--Claims 1-16 (Canceled).

Claims 17-43 (New).

IN THE ABSTRACT OF THE DISCLOSURE

Page 56, delete in the entirety.

Abstract (New).--

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private meteorologists. They in turn prepare forecasts and warnings based on both processed and raw data.

The Synoptic Weather Program is designed to serve as the backbone for the preparation of forecasts and to provide data for international exchange. Surface observations are taken all over the globe at standard times: 0000, 0600, 1200, and 1800 Greenwich mean time (GMT), and sent in synoptic code.

The Basic Observation Program routinely provides meteorological data every hour. Special observations are taken at any intervening time to report significant weather events or changes. The vast majority of stations involved in either or both programs are operated by National Weather Service and Federal Aviation Administration personnel and are referred to as first-order stations. Observational sites are primarily at airports; a few are in cities. They all report the following weather elements: present weather, air pressure, temperature, humidity, wind speed and direction, visibility, and clouds and ceilings. *See* AIR PRESSURE; CLOUD; HUMIDITY; WIND.

Upper air observations are made with an instrument called a radiosonde, borne aloft by a helium-inflated balloon. It measures and then telemeters back to ground stations the pressure, temperature, and water vapor existing in the atmosphere up to about 100,000 ft (30 km). Winds aloft are computed by tracking the instrument with precision electronic equipment. Those measurements plus radar and satellite observations provide meteorologists with a three-dimensional picture of the atmosphere. *See* METEOROLOGICAL SATELLITES; RADAR METEOROLOGY; WEATHER FORECASTING AND PREDICTION. [A.E.T.]

Weathering processes The response of geologic materials to the environment (physical, chemical, and biological) at or near the Earth's surface. This response typically results in a reduction in size of the weathering materials; some may become as tiny as ions in solution.

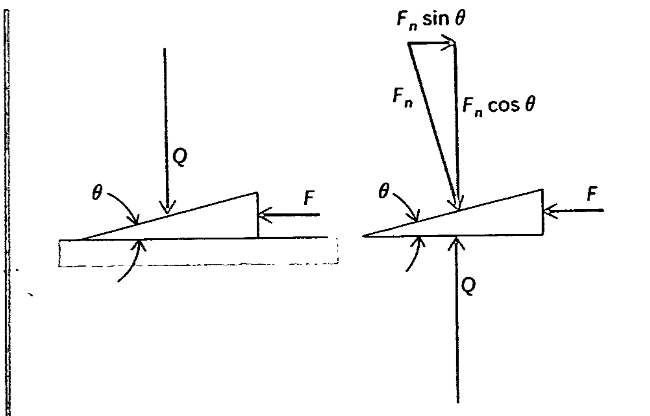
The agents and energies that activate weathering processes and the products resulting therefrom have been classified traditionally as physical and chemical in type. In classic physical weathering, rock materials are broken by action of mechanical forces into smaller fragments without change in chemical composition, whereas in chemical weathering the process is characterized by change in chemical composition. In practice, however, the two processes commonly overlap.

Specific agents of weathering may be recognized and correlated with the types of effects they produce. Important agents of weathering are water in all surface occurrences (rain, soil and ground water, streams, and ocean); the atmosphere (H_2O, O_2, CO_2, wind); temperature (ambient and changing, especially at the freezing point of water); insolation (on large bare surfaces); ice (in soil and glaciers); gravity; plants (bacteria and macroforms); animals (micro and macro, including humans). Human modifications of otherwise geologic weathering that have increased exponentially during recent centuries include construction, tillage, lumbering, use of fire, chemically active industry (fumes, liquid, and solid effluents), and manipulation of geologic water systems.

Products of physical weathering include jointed (horizontal and vertical) rock masses, disintegrated granules, frost-riven soil and surface rock, and rock and soil flows. Products of chemical weathering include the soil, and the clays used in making ceramic structural products, whitewares, refractories, various fillers and coating of paper, portland cement, absorbents, and vanadium. These are the relatively insoluble products of weathering; characteristically they occur in clays, siltstones, and shales. Sand-size particles resulting from both physical and chemical weathering may accumulate as sandstones.

After precipitation, the relatively soluble products of chemical weathering give rise to products and rocks such as limestone, gypsum, rock salt, silica, and phosphate and potassium compounds useful as fertilizers. [W.D.K.]

Wedge A piece of resistant material whose two major surfaces make an acute angle. It is closely related to the inclined plane and is used to multiply the applied force and to change the direction in which it acts (see illustration). *See* INCLINED PLANE.



Forces acting on a wedge.

Force F is the smaller applied force and Q is the larger force to be exerted. In the absence of friction, forces must act normal to their surfaces; thus the actual force on the inclined surface is not Q but a larger force F_n. Summing up forces in the horizontal and vertical directions gives Eqs. (1).

$$F_n \sin\theta - F = 0 \qquad Q - F_n \cos\theta = 0 \qquad (1)$$

Combining the expressions for F and Q and solving for F gives Eq. (2).

$$F = Q \tan\theta \qquad (2)$$

If angle θ is small, the reaction of Q against F is exceeded by the friction between the face of the wedge and the adjacent body on which it rests. Thus the wedge tends to remain in position even when loaded by a large force Q. *See* SIMPLE MACHINE. [R.M.Ph.]

Weight The gravitational weight of a body is the force with which the Earth attracts the body. By extension, the term is also used for the attraction of the Sun or a planet on a nearby body. This force is proportional to the body's mass and depends on the location. Because the distance from the surface to the center of the Earth decreases at higher latitudes, and because the centrifugal force of the Earth's rotation is greatest at the Equator, the observed weight of a body is smallest at the Equator and largest at the poles. The difference is sizable, about 1 part in 300. At a given location, the weight of a body is highest at the surface of the Earth. Weight is measured by several procedures. *See* BALANCE; MASS; WEIGHT MEASUREMENT. [H.S.B.]

Weight measurement Weight is the resultant force acting on a mass (in a vacuum) due to the Earth's gravitational field corrected for the effect of the Earth's rotation. Units of weight are based upon an acceleration of gravity. When the weight of an unknown is determined by comparison with a known weight, there is no error in the readings due to gravity variations. The varying buoyant effect of the atmosphere is negligible when the density of the unknown is approximately the same as that of the standard. In precision weighing, the buoyant effect of air must be considered. *See* GRAVITY.